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## CAUSES OF ILLNESS IN 9,000 FAMILIES, BASED ON NATION-WIDE PERIODIC CANVASSES, 1928-1931\*

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Mortality data are now available for all but one State and are published annually in great detail with respect to cause, age, sex, place of residence, etc. However, the important causes of death are not the most frequent causes of illness, and the mortality picture that can be painted in considerable detail does not adequately or properly represent the sickness situation.

As compared with mortality, the paucity of sickness records is almost unbelievable. Morbidity reports as furnished by physicians to local health departments are available in summarized form for many States (1), but aside from including only a few causes, they are woefully incomplete even for the reportable diseases. Special studies in a few localities (6) have made available reports by physicians of all diseases seen by them, but they give no indication of the large number of illnesses that are not attended by doctors.

The most complete morbidity records for an approximately full list of diseases refer to the sickness experience of members of a group of

\* From the Office of Statistical Investigations, U. S. Public Health Service. This is the first of a series of papers on sickness and medical care in this group of families. The survey of these families was organized as the basic investigation of the Committee on the Costs of Medical Care. After the records had been accumulated by the Committee, a cooperative arrangement between the Committee and the Public Health Service was made and the data were tabulated under the joint supervision of the Office of Statistical Investigations and members of the research staff of the committee. Committee publications based on the results are to deal primarily with costs and Public Health Service publications primarily with the incidence of illness and the extent and kind of medical care, without regard to cost. As costs are meaningless without the extent and nature of the service received, there will inevitably be some overlapping.

Grateful acknowledgment is made for advice and assistance received in the course of the study from various members of the research staff of the Committee on the Costs of Medical Care, particularly Dr. I. S. Falk and Miss Margaret Klem, and from members of the statistical staff of the Public Health Service. Special thanks are due to Dr. Amanda L. Stoughton for advice and assistance in classifying the causes of sickness and death, and to Miss Lily Vanzee, who was in immediate charge of tabulating the data.

industrial sick benefit associations. Records are available since 1920 but they are confined to severe illnesses causing absence from work of more than one week (2). A few special studies have been made of sickness among employees of certain industrial companies (3) and of school children (4, 7, 9, 12).

Extensive surveys to determine the *prevalence on a given day* of various kinds of sickness have been made of the families of insured persons (10). In a study in Hagerstown (11) a *series* of visits was made to each of about 1,800 representative families and all illness that occurred in the course of a 28-month period recorded; the total observation on the almost 8,600 individuals amounted to nearly 17,000 person-years of life. This is apparently the only study of *sickness incidence over a period of time* in a population of all ages and both sexes, in contrast to the wealth of mortality data of this kind extending over many years in nearly every civilized country in the world.

The present project, which generally followed the Hagerstown method, covered about 9,000 families observed for 12 months in 18 States with a total of nearly 39,000 person-years of life. It is therefore the largest mass of data on the *incidence of sickness over a period of time* that is now available for illnesses of all kinds in a fairly representative general population group. Only by such intensive studies can the real incidence of illness be ascertained. With a population of the size surveyed in this study an opportunity is afforded for finding the frequency of some of the more rare conditions as well as the common causes of illness.

#### METHOD OF COLLECTING THE DATA

The object was to obtain a complete record of illness and of medical and dental care in a group of representative families for a 12-month period. During the year a series of visits was made to the home of each family to obtain by an interview with the housewife or other responsible member of the household the desired information about illness and medical care and record the data on a schedule prepared for that purpose. The data collected on the first regular canvass included a household census, with the name, sex, color, age, marital status, and occupation of each member of the family. On this call there was also obtained a record of any illness that had occurred within one month<sup>1</sup> prior to the visit. On subsequent visits made at intervals of two to four months, with an occasional family with a slightly longer interval, a record was obtained of illnesses that had occurred since the preceding call. Usually a family was canvassed five or six times during the year, but occasional households received as few as four and others as many as eight visits, with some additional calls to check up incomplete records. Information recorded about

<sup>1</sup> In some communities illness was recorded for two months prior to the first visit instead of only one.

each illness reported to the investigator included the diagnosis or cause of the illness, date of onset, duration of the illness, and many detailed facts about the nature and extent of medical care of various kinds by different practitioners and institutions. Costs were also obtained, and these data are included in the committee's report (8).

Suitable areas for the type of families to be canvassed in a State were selected by conference with the State and local health officers. The actual canvassing was done by health department or other visiting nurses in the various communities that were studied. Arrangements were made through the health department for the nurse to do this work in addition to her regular duties, provided she was willing to undertake it. In inaugurating the study, the nurse did not include the regular families to which she was called by sickness, but selected a new group without respect to the presence or absence of illness in the household at the time of the initial visit. Usually the selection was by a house-to-house canvass.

Since the nurse's work was on a voluntary basis and in addition to her regular duties, it may at first appear that she would not give the same care to obtain exact data and make regular visits as would a paid investigator on a full-time basis. The completeness with which the many detailed items on the schedule were recorded indicates that this was not the case, and it is believed that the advantages of a full-time paid investigator are counterbalanced to a considerable extent by the fact that the volunteer nurse carried only 25 to 50 families, with whom she became rather intimately acquainted, whereas the full-time investigator would be expected to carry at least 300 families and would be unable to remember the situations in each family in the same detail. Since the nurse was approached through the health officer and undertook the job at his suggestion, she can not be looked upon as wholly a volunteer worker, for the satisfactory completion of the job became to a considerable extent something for which she was responsible to the health officer as well as to the Committee on the Costs of Medical Care.

#### COMPOSITION OF THE SURVEYED POPULATION

In a study of this kind, made through the cooperation of State and local health departments and visiting nurses, the data are necessarily confined to localities whose health departments would give a part of the time of one or more nurses to collect the special information. It is not intended to suggest that the willingness to cooperate was limited to the 130 localities included in the study, for it was impossible to include every community or to sample every State. It does mean, however, that the surveyed families all reside within localities having city or county health departments or visiting nurses, and the extent of service received in these families from health

departments and visiting nurses would not be representative of communities where such organizations do not exist.

The present study is based on 8,758 white families that were kept under observation for a full 12-month period. Of the 39,185 individuals in the families, 96.5 per cent were under observation for the whole period, the other 3.5 per cent being accounted for by births, deaths, and persons who because of marriage, separation, or other reasons left or entered an observed family during the year. Reduction of the part-time individuals to a full-time basis gives a total full-time person-years of life of 38,544.

Although each family was observed for sickness for 12 consecutive months, the date of the observation period varied for different families. Records for the first households began in February, 1928, and those for the last ended in June, 1931. More families were under observation in December, 1929, than in any other month. Fifty per cent or more of the households were under observation during each month from May, 1929, to April, 1930, inclusive, and October or November of 1929 may be taken as the midpoint of the survey. In general the families in the large cities (over 100,000) were surveyed somewhat earlier and those in towns and rural areas somewhat later than the average for all groups. Only about one-fourth of the households were under observation during December and January, 1928-29, at the time of the rather extensive influenza epidemic and, therefore, the respiratory illness records are not unduly influenced by the inclusion of this epidemic period. Table 1 gives the per cent of families that were under observation during each month.

TABLE 1.—*Time distribution of the observation period for the surveyed families*

[Per cent\* of the 8,758 families that were under observation during each month, February 1928-June 1931]

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1928		0.08	0.05	1.2	2.3	3.8	6.1	8.7	10.5	14.1	16.8	18.8
1929	28.7	35.4	40.7	46.9	54.4	57.9	58.8	59.6	60.5	59.8	60.3	63.7
1930	62.6	59.5	56.8	49.7	41.8	38.3	35.1	31.7	28.9	26.1	22.9	17.4
1931	8.6	5.1	2.5	2.2	1.6	.1						

\* Percentages add to 1200.0; since each family was under observation in 12 different months.

The geographic distribution of the families is shown by the accompanying map (fig. 1), on which each dot represents approximately 25 households. Families from 130 localities in 18 States are included, in which all nine of the usual census geographic sections except the West South Central have some representation. The map gives the appearance of an undue concentration of surveyed households in the North and East, but the general population is also dense in these sections. Table 2 shows the proportion of the surveyed families that

reside in each of four broad geographic areas as compared to all white families in the United States. These percentages indicate that the Northeast and the South (except the Atlantic seaboard) are somewhat underrepresented and the Pacific coast is somewhat overrepresented in the surveyed families.

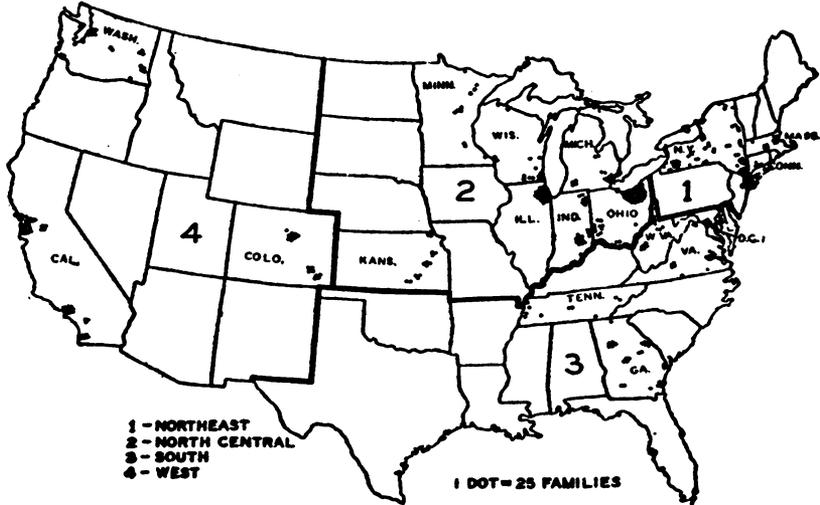


FIGURE 1.—Geographic distribution of 8,758 families observed for 13 consecutive months in 130 localities in 18 States, 1928-1931

TABLE 2.—Geographic distribution of the surveyed families and of white families in the United States

Population group	Per cent of families living in each geographic area				
	All sections	Northeast <sup>1</sup>	North Central <sup>1</sup>	South <sup>1</sup>	West <sup>1</sup>
Surveyed families, 1928-1931.....	100.0	23.9	37.1	18.1	20.9
United States, 1930.....	100.0	30.2	35.0	23.6	11.2

<sup>1</sup> Northeast=New England and Middle Atlantic; North Central=East and West North Central; South=South Atlantic and East and West South Central; West=Mountain and Pacific.

Table 3 shows the number of surveyed families in each State classified according to the size of the city in which they resided, with towns under 5,000 population further classified as industrial or agricultural.

TABLE 3.—Distribution of families according to geographical section, State, and size of community

[8,758 families surveyed for 12 consecutive months, 1928-1931]

Section and State	All communities	Cities with population of—				Towns with less than 5,000		Rural areas
		500,000 and over	100,000 but under 500,000	25,000 but under 100,000	5,000 but under 25,000	Industrial	Agricultural	
<b>All sections:</b>								
Number.....	8,758	1,854	1,549	1,362	785	602	1,120	1,486
Per cent.....	100.0	21.1	17.7	15.5	9.0	6.9	12.8	17.0
<b>Northeast</b> .....	2,097	312	349	259	148	94	514	421
New York.....	1,710	312	92	159	148	94	514	391
Massachusetts.....	267		157	100				30
Connecticut.....	100		100					
<b>North Central</b> .....	3,249	1,213	355	420	439	244	144	434
Illinois.....	463	463						
Ohio.....	1,148	602	160	64	93	85	72	72
Michigan.....	329	148	41	94				46
Indiana.....	494		127	82	133	7	12	153
Wisconsin.....	280			154	23	38	46	29
Minnesota.....	224				28	78	14	104
Kansas.....	301		27	76	162	36		
<b>South</b> .....	1,685		405	504	118	108	133	317
District of Columbia.....	99		99					
Virginia.....	412		193	93	37		67	22
West Virginia.....	318			171		84		63
Tennessee.....	212				8	24		26
Georgia.....	544		113	240	73			40
<b>West</b> .....	1,827	329	440	179	80	156	229	314
Washington.....	551		211		70			99
California.....	890	329	42	72	10	156		66
Colorado.....	386		187	107				92

It will be of interest to compare the members of these 8,758 families with the general population of the United States with respect to certain characteristics that were included in the census of 1930. First as to the size of the city or town in which they resided, Table 4 shows the percentage of the surveyed population that lived in communities of different sizes as compared with the total population of the United States and of the 18 States included in the survey. As compared with the total population it will be seen that the surveyed group is somewhat overweighted for persons living in large cities and somewhat underweighted for persons living in rural unincorporated areas. The distribution of the canvassed population according to size of the city of residence is considerably more similar to that of the 18 States included in the survey than to that of the total United States. When the six kinds of communities are combined into three groups, as in the lower section of Table 4, the surveyed and the total population of the 18 States included in the survey are quite similar. Even in these broad groups, however, the surveyed families as compared with the total United States are somewhat overweighted for large cities and underweighted for towns and rural areas.

TABLE 4.—Size of city of residence for the surveyed and for the white population of the United States

[Percentage of the population living in communities of specified sizes]

Population group	All communities	Cities with population of—				Towns with less than 5,000	Rural unincorporated areas
		500,000 and over	100,000 but under 500,000	25,000 but under 100,000	5,000 but under 25,000		
Surveyed, 1928-1931.....	100.0	20.3	16.9	15.9	9.2	10.8	17.9
Total of the 18 States, 1930 <sup>1</sup> .....	100.0	24.9	14.4	11.1	11.5	9.5	28.6
Total United States, 1930.....	100.0	17.0	12.6	10.5	12.2	11.3	36.4
Surveyed, 1928-1931.....	100.0	37.2		25.1		37.7	
Total of the 18 States, 1930 <sup>1</sup> .....	100.0	39.3		22.6		38.1	
Total United States, 1930.....	100.0	29.6		22.7		47.7	

<sup>1</sup> The 18 States in which the surveyed families reside.

The mean size of the surveyed families was 4.41 persons as compared with 3.80 for white families in the United States in 1930. When one-person households are omitted from the census, as nearly all were from the surveyed group, the means are 4.46 for the canvassed and 4.03 for the general population. The corresponding medians for families of two or more persons are 4.16 and 3.61. Table 5 shows the distribution of families according to size in the United States and in the surveyed group. The modal white family in the United States in 1930 consisted of only two persons, but in the surveyed group it consisted of four persons.

TABLE 5.—Size of surveyed families and of white families in the United States

Population group	Average number of persons per family <sup>1</sup>		Per cent of families with specified numbers of persons									
	Mean	Median	1	2	3	4	5	6	7	8	9	10 and over
			United States, 1930.....	3.80	3.42	7.4	23.2	21.2	18.0	12.2	7.6	4.6
Surveyed families, 1928-1931.....	4.41	4.13	1.5	11.2	21.3	25.2	17.8	10.5	5.8	3.2	1.7	1.8
Cities over 100,000.....	4.24	4.00	1.5	11.8	23.7	25.9	17.4	9.0	5.5	2.8	1.3	1.1
Cities 5,000 but under 100,000.....	4.50	4.22	1.4	8.5	19.9	28.1	18.8	11.3	5.4	2.9	1.6	2.1
Towns under 5,000 and rural areas.....	4.52	4.23	1.6	12.4	19.8	22.4	17.5	11.5	6.5	3.9	2.1	2.3

<sup>1</sup> For families of 2 or more persons averages are as follows: Means, United States, 1930, 4.03; surveyed, 4.46; medians, United States, 1930, 3.61; surveyed, 4.16.

With respect to age distribution, Table 6 affords a comparison of the surveyed population with the United States census white population of 1930. In general there is an excess of children and a deficiency of older persons in the surveyed group as compared with the general population. The surveyed group tends to be composed of families with children and therefore of family heads of childbearing age rather than older people. One-person families were deliberately avoided in

the survey and this fact at least partly accounts for the excess of children.

TABLE 6.—Age distribution of the surveyed and of the white population of the United States

[Per cent of the population in each age group]

Population group	All ages	Under 5	5-9	10-14	15-19	20-24	25-34	35-44	45-54	55-64	65 and over
Both sexes:											
Surveyed population, 1928-1931.....	100.0	13.4	15.0	12.0	8.1	5.7	14.9	15.5	8.8	8.9	2.7
United States, 1930.....	100.0	9.1	10.1	9.7	9.3	8.7	15.4	14.1	10.8	7.1	8.7
Ratio of surveyed to United States (U. S. = 1.00).....	1.00	1.47	1.49	1.24	.87	.66	.97	1.10	.81	.55	.47

With respect to sex, there are relatively fewer males in the surveyed population than in the United States as a whole. (Table 7.) In the United States there are 103 males of all ages for each 100 females, while in the surveyed group there were 96 males per 100 females.

TABLE 7.—Males per 100 females in the surveyed population and in the white population of the United States

Population group	All ages	Under 5	5-9	10-14	15-19	20-24	25-34	35-44	45-54	55-64	65 and over
Surveyed population, 1928-1931.....	96	105	97	102	99	73	74	101	122	119	79
United States, 1930.....	103	104	103	103	100	97	99	106	109	107	109

Table 8 shows the proportion of family heads in the surveyed group that were native born, as compared with white families in the United States. Considering all geographic sections, 85 per cent of the surveyed family heads were native born, as compared to 78 per cent in the general white population. The discrepancy is accounted for by the Northeast and the North Central sections, the surveyed family heads in the South and West being quite similar as to nativity to those in the general populations of the respective sections.

TABLE 8.—Nativity of family heads in the surveyed and in the white population of the United States

[Per cent of family heads in different geographic divisions that were native born]

Population group	Total United States	North-east <sup>1</sup>	North-Central <sup>1</sup>	South <sup>1</sup>	West <sup>1</sup>
Total United States, 1930.....	78.5	63.4	79.6	96.2	78.7
Surveyed families, 1928-1931.....	85.5	81.5	85.7	96.8	79.9
Cities over 100,000.....	78.0	68.4	79.3	95.1	74.3
Cities 5,000 but under 100,000.....	92.0	81.5	92.5	96.3	96.3
Towns under 5,000 and rural areas.....	89.2	89.9	90.9	98.9	80.0

<sup>1</sup> See Figure 1 and Tables 2 and 3 for States included in the different sections.

Table 9 shows the marital status of persons of specific ages in the surveyed families and in the general population. In the canvassed group 72 per cent of the persons 15 years old and over are married, as compared with 61 per cent in the general population. Considered by age, this higher percentage married in the surveyed population is true for all age groups except 15-19 years, but at 20-24 years the percentages are practically the same. Inasmuch as the canvassed group is made up of natural families and therefore excludes boarding houses and institutions of various kinds where the single and widowed would be found to predominate, it might be expected that the surveyed families would contain relatively more married persons.

TABLE 9.—*Marital status of the surveyed and of the total population of the United States*

[Per cent of persons of the specified sex and age that were married]

Population group	Total over 15 years	15-44	15-19	20-24	25-29	30-34	35-44	45-54	55-64	65 and over
<b>Both sexes:</b>										
Surveyed population, 1928-1931.....	71.7	68.2	3.2	40.7	84.0	91.8	93.0	90.9	81.9	52.0
United States, 1930.....	60.7	55.5	7.2	40.2	68.0	78.8	81.6	78.6	70.4	49.3
<b>Male:</b>										
Surveyed population, 1928-1931.....	74.0	66.8	.8	25.8	82.0	93.0	96.1	95.7	93.7	72.8
United States, 1930.....	60.1	52.0	1.7	28.2	61.4	76.1	81.6	81.7	78.1	63.8
<b>Female:</b>										
Surveyed population, 1928-1931.....	69.6	69.4	5.5	51.6	85.3	90.7	89.8	85.1	67.8	35.4
United States, 1930.....	61.2	61.0	12.7	51.7	74.4	81.6	81.6	75.3	62.1	34.8

Family income is of vital importance in any consideration of the character and extent of medical service received. In collecting the data the object with respect to income was to include in the surveyed households a reasonably adequate sample of families of different income levels with no special effort to obtain a distribution according to income that was similar to that in the United States. However, the distribution of total families included in the survey is not dissimilar to that of the estimated distribution in the United States at the time the survey was made. The last year for which an estimated distribution of families in the United States according to income is available is 1928. Estimates of average income have been made for later years. In 1929 average income was greater and in 1930 it was less than in 1928. The great bulk of the sickness observations were made in 1929 and 1930 before the large decrease in income that has taken place since those years. The 1928 distribution of family incomes is therefore not inappropriate for comparison with the incomes of the surveyed families. Table 10 affords a comparison of the distributions. The original estimate made for the Committee on the Costs of Medical Care by Dr. Maurice Leven was later revised by him and others of the Committee's research staff. Both distributions are shown in the table. Whether the original or the revised esti-

mate for the United States is taken as the standard, it may be seen that the surveyed group is somewhat overweighted by families with incomes above \$5,000 and somewhat underweighted by those with incomes under \$2,000. Part of the discrepancy may be due to the fact that the canvassed families are all white, but data are not available for the estimated incomes of white families for the country as a whole. In general the survey and whole population income distributions are rather similar, and the total canvassed group can therefore be dealt with as a unit without giving results that are unduly influenced by the difference between the incomes of these families and those in the United States generally.

TABLE 10.—*Income distribution of families in the surveyed group and in the total United States*

Population group	Per cent of families <sup>1</sup> in specified annual income classes						
	All incomes	Under \$1,200	\$1,200 but under \$2,000	\$2,000 but under \$3,000	\$3,000 but under \$5,000	\$5,000 but under \$10,000	\$10,000 and over
Surveyed families, 1928-1931.....	100.0	15.1	32.9	26.0	13.9	8.5	3.6
United States, 1928:							
Original estimate.....	100.0	15.0	34.8	24.6	15.7	7.0	2.9
Revised estimate.....	100.0	20.0	33.2	22.1	14.9	6.9	2.9

<sup>1</sup> Families of more than one person each. The 133 families of one person each in the surveyed population are disregarded. Data supplied by the Committee on the Costs of Medical Care (8) from estimates by Maurice Leven based on the distribution of individual incomes.

CASES INCLUDED AND THE CLASSIFICATION OF THEIR CAUSES

In this project, as in the Hagerstown study, what was reported as an illness was to a considerable extent a matter of what the patient or the family considered of sufficient importance to be remembered and designated as such. In both instances it might be said that an illness was defined as any condition, symptom, or disorder which persists for one or more days. To this definition for the Hagerstown project was added in the present study any condition for which medical service (exclusive of dental service, eye refractions, immunizations, and health examinations) was received and any condition for which drugs costing 50 cents or more were purchased. It is possible, therefore, that a number of conditions so mild that they were not reported as illness in the Hagerstown project were included in the medical care study because of an expenditure for drugs or a visit to a physician or other practitioner. In the medical care study, data were also collected on dental care, eye refractions, immunizations, and health examinations in which the patient was seldom ill in the usual sense of the word; but the present report is confined to illnesses and the consideration of these other medical and dental services is reserved for later papers. Obviously the record would contain rela-

tively few physical defects such as would be found on physical examination.

Illnesses that extended into the observation period were included even if the onset was prior to the study year. This policy was adopted because of the cost element and the desire to include all cases involving medical service or costs within the study period. For chronic conditions like nephritis, heart disease, diabetes, etc., the onsets are so gradual and the durations so long that the accumulated cases causing illness during the period of observation are far more important than the few cases that can be identified as having their original onset within this period. It was decided, therefore, in conformity with the method of tabulating chronic cases in the Hagerstown data, to include all that caused illness during the study whether or not the original onset of the disease fell within this period. The total number of cases with onset prior to the study was small, and the number for acute diseases was practically negligible. Rather than institute a different procedure for acute and chronic illnesses which would involve a decision in every case as to whether the condition was chronic, the acute cases with onset prior to the study were also included in the tabulation. For similar reasons a second attack within the study year of a more or less chronic condition was tabulated as a separate illness. The data, therefore, refer to illnesses rather than to cases of disease, but the numbers of second attacks of specific diagnoses within the 12-month period are negligible.

In coding the data, any continuous period of sickness was counted as one illness regardless of the number of diagnoses or their apparently unrelated character. A person sick with measles, mumps, and chickenpox without any intervening period between the cases was coded as a single illness and so tabulated in counting the total number of illnesses. To avoid losing the record of all except one of these diagnoses, a supplementary card was made for all contributory causes, and in the majority of the tabulations presented herewith the total number of cases of a given diagnosis, both primary and contributory, are included. For example, pneumonia cases would include all pneumonia whether a primary cause of illness or a complication or sequela of measles, whooping cough, influenza, or other disease. For the great majority of the diseases the contributory causes are few, but in the instance of some categories, such as pneumonia, otitis media, and others that commonly occur as sequelae to acute conditions of much less severity, the data would be incomplete without including these contributory causes with the primary cases of the same diagnosis.

An exception to the rule of a continuous period of sickness being counted as one illness was made for acute cases (such as colds, indigestion, etc.) occurring in an individual with some chronic condition (such as tumor, goiter, partial paralysis, etc.) which lasted throughout

the year, but which gave the patient little trouble. To apply here the general rule that the simultaneous occurrence of the two diagnoses be coded as a single illness would mean that persons with such chronic conditions could have but one illness during the study no matter how many times they had a cold or other acute condition. The instances of this kind were few, because many of the chronic cases represent definite attacks of more or less limited durations and not the whole course of the disease. A chronic impairment or disease generally appears in the illness record only when it causes some distress or is the subject of a medical consultation or examination.

When one of two diagnoses mentioned in reporting an illness was merely a symptom of the other, the case was coded with only one diagnosis. For example, grippe and headache, cold and fever, or kidney trouble and backache were coded as sole diagnoses and the symptoms disregarded. In a case in which the only diagnosis reported was merely a symptom, such as headache, dizziness, or rash, the symptom was coded as the diagnosis since there evidently was an illness and no better cause was available for the case. Occasionally symptoms were listed along with diagnoses to which they had no relation, but must have arisen from some separate and distinct condition. In such cases they are coded as contributory diagnoses. Respiratory illnesses were carefully checked to make sure that successive stages of the same case would not be coded as two diagnoses merely because two parts of the respiratory tract were mentioned. For example, bronchitis and coryza, influenza and tonsillitis, bronchitis and sore throat were all coded as sole diagnoses, but because of their frequency the detailed code provided separate numbers for these and other respiratory combinations. Cases reported as cold followed by pneumonia were coded as pneumonia only. Whatever diagnoses were coded as contributory causes of sickness were judged to be separate entities and not mere symptoms or stages in the progress of the primary cause of illness. The separate entities, however, were often sequelae of the original diagnoses, such as cold and indigestion, measles and pneumonia, scarlet fever and nephritis.

The causes of illness were necessarily those reported by the household informant and therefore represent what the patient or family thought was the matter. Correction of the original report was secured by submitting all cases seen by any practitioner to the attendant for verification or revision. The doctor's check on the diagnosis was obtained for 64 per cent of the cases seen by a practitioner, which amounted to a check of 51 per cent of all cases. Causes of death for fatal cases were obtained from the death certificates filed with the State health departments.

The causes were classified according to the International List of the Causes of Sickness and Death (1920 revision), with many subdivisions

of the diagnosis categories. A list of the causes of death is wholly inadequate for classifying illnesses, because mild but frequent causes of sickness fall in the same categories with infrequent severe diagnoses that are obscured by the large number of the former. The Manual of the International List as published by the Division of Vital Statistics of the United States Bureau of the Census was used to assist in the allocation of the diagnosis to the proper class.

Considering all illnesses in the sense of continuous periods of sickness, only 4.3 per cent of those reported in this study were designated as due to more than one cause. Although the number was small, it is important in interpreting the data to know the method of selecting the cause tabulated as primary. In this connection it should be noted that the word *primary* as generally used in discussions of the causes of death has two more or less logical meanings, viz (a) primary or first in time, as in measles and pneumonia, and (b) primary in importance as in heart disease and rheumatism. Because of this double meaning and of other difficulties, the determination of the primary of two or more causes of illness reported for a single case is often somewhat arbitrary, particularly when the schedule does not contain information as to the cause considered primary by the patient. The following general rules used in selecting the primary cause in the Hagerstown study (11) were also followed in this study:

(a) The *first* cause in order of occurrence, applied largely to acute conditions with common complications; such as influenza and pneumonia, measles and otitis media, scarlet fever and nephritis.

(b) *Acute* conditions ordinarily were given preference over an attack of some chronic condition. Thus, in case of gripe and chronic rheumatism, the gripe was considered primary.

(c) The condition or disease *most specifically associated with the period of sickness* was preferred over a minor condition which preceded or accompanied it. For example, tooth abscess and rheumatism; the latter was made primary. When it was difficult to determine the factual basis, the more serious condition was chosen.

(d) The *more specific* cause was given preference over a statement of a symptom.

(e) When none of the above rules could be applied, and the history of the individual gave no basis for decision, the condition mentioned first by the informant was made primary.

An exception to these rules was made in the classification of fatal cases, the causes of death being classified as primary or contributory strictly in accordance with the Manual of Joint Causes of Death published by the division of vital statistics of the United States Bureau of the Census. The data for the few deaths occurring in this study will have to be supplemented by official mortality reports and exact comparability is therefore necessary. In any consideration of case fatality or of the ratio of cases to deaths, both primary and contributory cases and deaths from a given cause must be considered and the

choice of the primary cause of the illness or of the death will not change the results.

#### THE CAUSES OF ILLNESS CLASSIFIED IN BROAD GROUPS

Table 11 shows the cases of illness classified in broad groups generally following the International List, but with some modifications. For each of the cause groups, numbers and rates are shown for cases with sole or primary diagnosis and for cases with diagnoses that were contributory to some other cause. Data are shown for the total number of cases, for cases that were sufficiently severe to cause the patient to lose one or more days from his usual occupation (disabling cases), and for cases that caused the patient to go to bed for one or more days. While it can not be claimed that all of the mild respiratory, digestive, skin, and other conditions were remembered and reported to the canvasser, it seems probable that the records are reasonably complete for all cases in which the patient lost some time from school, work, or other occupation, and it seems somewhat more probable that the reports are rather complete for cases that caused the patient to go to bed.

TABLE 11.—*Morbidity from groups of diseases in canvassed white families in 18 States during 18 consecutive months, 1928-1931*

[8,758 families including 39,185 individuals with 33,544 full-time years of observation. Of the individuals observed 19,199 were males, 19,930 were females and 56 of unknown sex]

Diagnosis groups, with the International List numbers, 1920 revision	Annual case rate per 1,000 persons observed			Number of cases			
	Total	Disabling	In bed	Total	Disabling	In bed	Onset of illness was prior to study year
<b>All causes:</b>							
Sole or primary.....	849.81	516.01	434.05	32,755	19,989	16,730	2,153
Contributory.....	39.75	29.55	26.54	1,532	1,150	1,023	262
Total.....	889.55	545.56	460.59	34,287	21,028	17,753	2,414
<b>Respiratory diseases (11, 31, 97-107, 100):</b>							
Sole or primary.....	348.46	238.58	212.87	13,431	9,196	8,206	343
Contributory.....	7.29	6.43	5.99	281	248	231	22
Total.....	355.75	245.02	218.87	13,712	9,444	8,436	375
<b>Epidemic, endemic, and infectious diseases (1-42 exc. 11 and 31):</b>							
Sole or primary.....	95.22	73.29	58.12	3,670	2,825	2,240	105
Contributory.....	1.45	1.35	1.25	56	52	48	5
Total.....	96.67	74.64	59.36	3,726	2,877	2,288	110
<b>Other general diseases (43-69):</b>							
Sole or primary.....	26.64	11.83	10.17	1,027	456	392	338
Contributory.....	2.96	1.92	1.66	114	74	64	45
Total.....	29.60	13.75	11.83	1,141	530	456	383
<b>Diseases of the nervous system (70-84):</b>							
Sole or primary.....	20.60	10.12	8.33	794	390	321	172
Contributory.....	2.49	1.63	1.48	96	63	57	87
Total.....	23.09	11.75	9.81	890	453	378	209
<b>Diseases of the eyes and annera (85):</b>							
Sole or primary.....	11.08	4.07	1.17	427	157	45	37
Contributory.....	.64	.26	.13	21	10	5	2
Total.....	11.62	4.33	1.30	448	167	50	39

<sup>1</sup> Causing loss of one or more days from school or usual occupation whether or not gainfully employed. All cases with one or more days in bed are assumed to be disabling.

TABLE 11.—Morbidity from groups of diseases in canvassed white families in 18 States during 12 consecutive months, 1928-1931—Continued

Diagnosis groups, with the International List numbers, 1920 revision	Annual case rate per 1,000 persons observed			Number of cases			
	Total	Disabling	In bed	Total	Disabling	In bed	Onset of illness was prior to study year
<b>Diseases of the ears and mastoid process (86):</b>							
Sole or primary.....	18.76	9.50	7.20	728	366	281	38
Contributory.....	4.77	3.45	3.17	184	133	122	
<b>Total.....</b>	<b>23.53</b>	<b>12.95</b>	<b>10.46</b>	<b>907</b>	<b>499</b>	<b>403</b>	<b>38</b>
<b>Diseases of the circulatory system (87-96):</b>							
Sole or primary.....	21.43	11.00	9.84	826	424	360	247
Contributory.....	5.24	4.10	3.81	202	158	147	59
<b>Total.....</b>	<b>26.67</b>	<b>15.10</b>	<b>13.15</b>	<b>1,028</b>	<b>582</b>	<b>507</b>	<b>306</b>
<b>Diseases of the teeth and gums (106):</b>							
Sole or primary.....	10.50	2.78	1.82	406	107	70	15
Contributory.....	1.04	.47	.43	40	18	16	3
<b>Total.....</b>	<b>11.62</b>	<b>3.24</b>	<b>2.23</b>	<b>446</b>	<b>125</b>	<b>86</b>	<b>17</b>
<b>Diseases of the digestive system (110-127):</b>							
Sole or primary.....	87.04	51.47	45.06	3,355	1,984	1,760	247
Contributory.....	4.85	3.29	2.91	187	127	112	20
<b>Total.....</b>	<b>91.89</b>	<b>54.77</b>	<b>48.57</b>	<b>3,542</b>	<b>2,111</b>	<b>1,872</b>	<b>267</b>
<b>Diseases of kidneys and urinary system (128-134):</b>							
Sole or primary.....	13.59	7.13	6.02	524	275	233	81
Contributory.....	1.84	1.40	1.06	71	54	41	19
<b>Total.....</b>	<b>15.44</b>	<b>8.54</b>	<b>7.08</b>	<b>595</b>	<b>329</b>	<b>273</b>	<b>100</b>
<b>Nonvenereal diseases of genital organs and annexa (135-142):</b>							
Sole or primary.....	15.88	8.90	8.25	612	343	318	93
Contributory.....	1.63	1.27	1.25	63	49	46	18
<b>Total.....</b>	<b>17.51</b>	<b>10.17</b>	<b>9.50</b>	<b>675</b>	<b>392</b>	<b>364</b>	<b>111</b>
<b>The puerperal state, including chronic conditions resulting from childbirth (143-150):</b>							
Sole or primary.....	27.32	25.37	25.24	1,053	978	973	59
Contributory.....	1.56	1.30	1.30	60	50	50	14
<b>Total.....</b>	<b>28.88</b>	<b>26.67</b>	<b>26.54</b>	<b>1,113</b>	<b>1,028</b>	<b>1,023</b>	<b>73</b>
<b>Diseases of the skin and cellular tissue (151-154):</b>							
Sole or primary.....	34.79	9.88	4.87	1,341	381	176	96
Contributory.....	1.40	.96	.67	54	37	26	12
<b>Total.....</b>	<b>36.19</b>	<b>10.84</b>	<b>5.24</b>	<b>1,395</b>	<b>418</b>	<b>202</b>	<b>106</b>
<b>Diseases of bones and organs of locomotion (155-158):</b>							
Sole or primary.....	10.64	4.46	3.24	410	172	125	103
Contributory.....	.57	.36	.34	22	14	13	2
<b>Total.....</b>	<b>11.21</b>	<b>4.83</b>	<b>3.58</b>	<b>432</b>	<b>186</b>	<b>138</b>	<b>105</b>
<b>Congenital malformations and other diseases of early infancy (159-163):</b>							
Sole or primary.....	2.05	1.22	1.17	79	47	45	21
Contributory.....	.13	.13	.13	5	5	5	
<b>Total.....</b>	<b>2.18</b>	<b>1.35</b>	<b>1.30</b>	<b>84</b>	<b>52</b>	<b>50</b>	<b>21</b>
<b>Accidents and other external causes (165-203):</b>							
Sole or primary.....	74.67	35.96	22.44	2,878	1,386	865	41
Contributory.....	.23	.21	.13	9	8	5	
<b>Total.....</b>	<b>74.90</b>	<b>36.17</b>	<b>22.57</b>	<b>2,887</b>	<b>1,394</b>	<b>870</b>	<b>41</b>
<b>Other and ill-defined causes (164, 204, 205):</b>							
Sole or primary.....	31.06	10.43	8.35	1,197	402	322	117
Contributory.....	1.74	1.01	.86	67	39	33	15
<b>Total.....</b>	<b>32.79</b>	<b>11.44</b>	<b>9.21</b>	<b>1,264</b>	<b>441</b>	<b>355</b>	<b>132</b>

Considering all illnesses (sole or primary only), there was a total for the year of 850 per 1,000 persons under observation. The rate for illnesses that caused absence from work or school or other usual occupation for 1 or more days was 516, and for illnesses that caused the patient to go to bed was 434 per 1,000 persons. Expressed in another way, 61 per cent of the illnesses reported were disabling and 51 per cent involved one or more days in bed. Of all cases reported, 79 per cent were attended by a physician or other practitioner.

In Figure 2 illness rates from broad groups of causes have been plotted. Inasmuch as the Hagerstown survey is about the only preceding one of a comparable nature, the rates obtained in that study

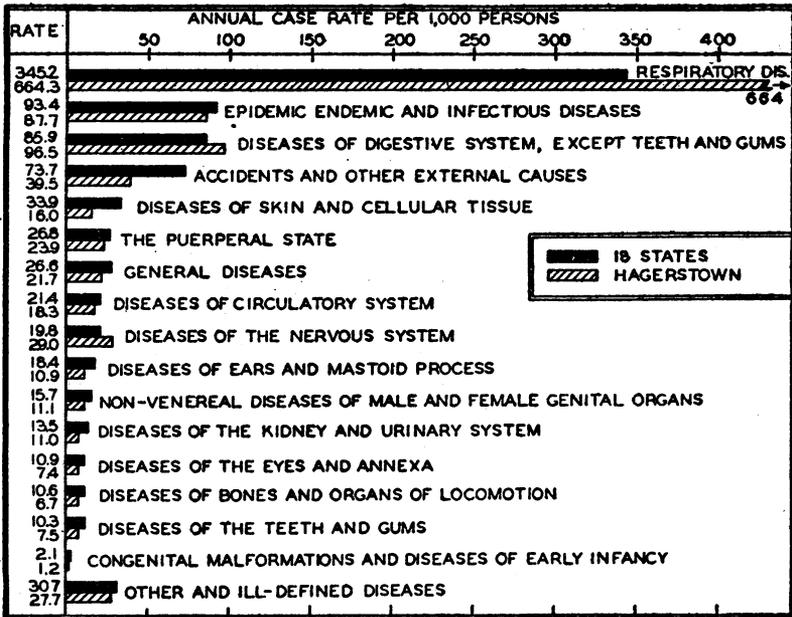


FIGURE 2.—Annual incidence of illness from broad groups of causes in canvassed families in 18 States and in the Hagerstown survey. (Primary causes only; data are exclusive of acute conditions with onset prior to study. A few changes have been made in the groups as published for Hagerstown (11) to secure comparability)

have been plotted for like groups of causes. To make the two sets of data comparable, the plotted rates represent sole or primary causes only and all acute conditions that had their onset prior to the study have been eliminated. The illness rate from all causes (sole or primary) as shown in Table 11 was 850 per 1,000 persons surveyed. When the acute cases with onset prior to the study are eliminated in accordance with the Hagerstown tabulation, the rate is 839 per 1,000, or 22 per cent less than the rate of 1,081 per 1,000 for the Hagerstown study.

In approximately 40 per cent of the Hagerstown cases the patient was confined to bed for one or more days. This would indicate that

the cases in bed amounted to a rate of 432 per 1,000 persons, or almost the same as the rate of 434 per 1,000 obtained in the present study.

The total rate for respiratory conditions in the present study, 345 per 1,000, was 48 per cent less than the Hagerstown rate of 664 per 1,000, but the nonrespiratory rate of 494 per 1,000 was 19 per cent greater than the Hagerstown rate of 416 per 1,000 for the same causes. In only two of the nonrespiratory disease groups, digestive and nervous, were the Hagerstown rates higher than the rates in the present study.

An examination of some of the detailed diagnoses included in the broad respiratory group indicates that the major differences between the two studies occur in the three diagnoses of colds and bronchitis, with the Hagerstown rate 2.5 times that found in the present study, influenza and gripe, with the Hagerstown rate 1.7 times that of the present study, and tonsillitis and other diseases of the pharynx and larynx, with a rate in Hagerstown 1.5 times the rate in the present study. Tonsillectomy, as might have been anticipated, was nearly three times as frequent in the present as in the Hagerstown study. The rates for pneumonia, asthma and hay fever, tuberculosis, and pleurisy were quite similar in the two studies.

Several circumstances appear to account for the higher Hagerstown respiratory rate: (a) The visits to the Hagerstown households were made at somewhat more frequent intervals, particularly during the last half of the study; (b) the Hagerstown study covered 28 months which included virtually all of 3 winters with their normally high respiratory rates, but only 2 summers with their normally low rates; (c) during the 28 months of the Hagerstown study 2 minor epidemics of respiratory disease occurred, those of February, 1922, and February, 1923, both of which were sufficiently important to be felt in nearly every section of the country (5). It has already been pointed out that although the larger influenza epidemic of 1928-29 fell within the period of the present study, only about one-fourth of the families were under observation during the epidemic months and the effect on the respiratory rate for the whole study would not be important.

The difference between the digestive-disease rate in the Hagerstown and the present study is relatively small but seems to be due largely to a higher rate for stomach conditions in the former data. The rate for diarrhea and enteritis, the other most frequent cause in this class, was higher in the present study than in the Hagerstown report.

A higher rate in Hagerstown for nervous diseases seems to be rather general for the various diagnoses in the nervous group, with neuralgia and neuritis and neurasthenia and nervousness accounting chiefly for the difference.

It might be worth while to examine a few of the causes in which the rates are higher in the present study than in Hagerstown. The accident rate was nearly twice as high as in Hagerstown. An examination of the specific causes of accidents indicates an increase in nearly every instance. The relative increase in automobile accidents is no greater than that in other causes. These increases can not be interpreted as changes with time, inasmuch as the present families are widely different from the Hagerstown families in many respects, including the size of the city in which they live.

The group of skin diseases also stands out with a rate in the present study that is more than twice the Hagerstown rate. An examination of specific causes indicates that nearly every skin condition is higher. Seasonally, skin diseases occur more frequently in the summer months and the disproportionately small number of summer months in the Hagerstown study may have been a factor in the low rate. Of perhaps more importance is the additional emphasis in the present study laid upon the reporting of all conditions for which medicines were purchased. The fact that skin diseases were particularly frequent in the higher-income groups lends color to this assumption (8).

In the present study a considerably higher proportion of the cases were attended by a physician. Considering all causes together, 79 per cent of the cases were attended by a practitioner, as compared with 47 per cent in Hagerstown. For respiratory diseases, the figures are 70 per cent for this study and only 35 per cent for Hagerstown. For nonrespiratory diseases 85 per cent of the cases were attended as against 65 per cent in Hagerstown. Even with wide differences in medical practice, these figures probably confirm the indications of the proportion of cases in bed, viz, that the Hagerstown canvasses secured reports on a larger proportion of the mild cases, particularly mild respiratory conditions, than was true in the present study.

#### SPECIFIC CAUSES OF ILLNESS

The observed population in the 18 States was sufficient to afford data on the incidence of some of the more rare conditions. Figure 3 shows sickness rates for all specific causes having a rate of 1.0 or higher per 1,000 population. The diagnoses used are as specific as could be obtained from the character of the data. Respiratory diseases have been divided into a number of groups, but it is impossible to separate chest and bronchial conditions from coryza because of a large group of colds without further qualification that may fall in either group. Similarly, diseases of the pharynx and larynx are in one group because of the large number of sore throats that may belong in either category.

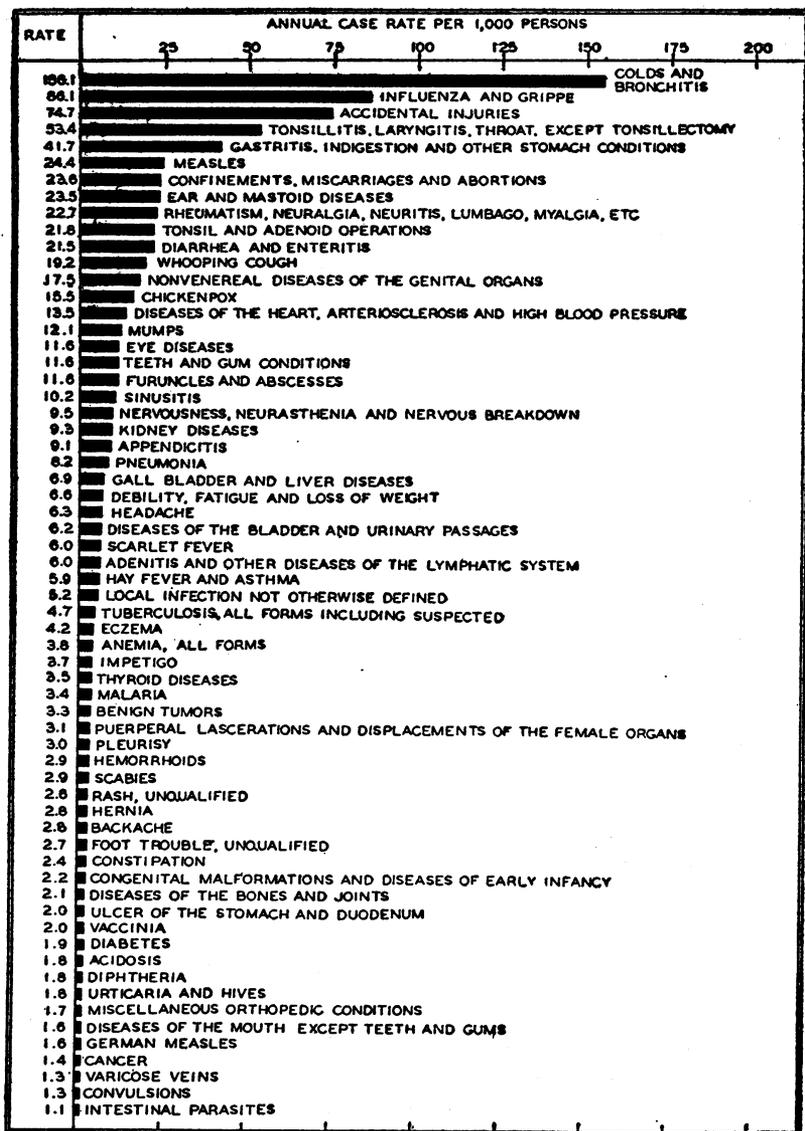


FIGURE 3.—Total annual incidence of specific conditions in surveyed families in 13 States, 1928-1931. (Primary and contributory causes)

TABLE 12.—Morbidity from certain diseases in canvassed white families in 18 States during 12 consecutive months, 1928-1931

[8,758 families including 39,185 individuals with 38,544 full-time years of observation. Of the individuals observed, 19,199 were males, 19,930 were females, and 56 of unknown sex]

Diagnoses, with the International List numbers, 1920 revision	Annual case rate per 1,000 persons observed			Number of cases				
	Sole, primary, or contributory			Sole, primary, or contributory			Contributory to some other diagnosis	Onset of illness was prior to study year
	Total	Disabling <sup>1</sup>	In bed	Total	Disabling <sup>1</sup>	In bed		
<b>Respiratory diseases (11, 31, 97-107, 109):</b>								
Influenza and grippé (11).....	86.14	76.61	72.96	3,320	2,953	2,812	14	38
Bronchitis and chest colds (99).....	48.85	32.35	28.93	1,893	1,247	1,115	34	32
Coryza, head colds (part of 97).....	58.82	25.66	20.60	2,267	989	704	8	14
Colds, unqualified (part of 107).....	48.44	28.12	21.85	1,867	1,084	842	19	10
Vincent's angina (part of 109).....	1.04	.39	.26	40	15	10	2	3
Tonsillitis (part of 109).....	23.27	19.33	17.77	897	745	685	11	3
Quinsy (part of 109).....	1.82	1.56	1.40	70	60	54	3	1
Sore throat (part of 109).....	17.02	8.61	6.46	656	332	249	9	2
Tonsillectomy and adenoidectomy (part of 109).....	21.82	21.33	21.20	841	822	817	16	20
Other pharynx and tonsil conditions (part of 109).....	4.49	2.75	2.40	173	106	96	14	7
Laryngitis (part of 98).....	2.83	1.58	1.40	109	61	54	2	4
Croup (part of 98).....	2.91	1.95	1.63	112	75	63	2	-----
Pneumonia, all forms (100, 101).....	8.20	8.20	8.20	316	316	316	48	9
Sinusitis (part of 97).....	10.25	5.14	4.02	395	198	155	35	43
Asthma and hay fever (105, part of 107).....	5.86	2.49	2.00	226	96	77	18	67
Pleurisy (102).....	2.96	2.70	2.44	114	104	94	26	5
Active respiratory tuberculosis (part of 31).....	2.72	2.02	1.82	105	78	70	2	76
Suspected respiratory tuberculosis (part of 31).....	1.22	.54	.47	47	21	18	7	22
Other respiratory diseases.....	7.11	3.68	2.98	274	142	115	11	19
<b>Epidemic, endemic and infectious dis. (1-42 exc. 11, 31):</b>								
Typhoid and paratyphoid fever (1).....	.39	.39	.39	15	15	15	-----	2
Malaria (5).....	8.35	2.80	2.72	129	108	105	2	1
Small pox (6).....	.39	.31	.31	15	12	12	-----	-----
Measles (7).....	24.39	22.65	22.00	940	873	848	13	6
German measles (part 25).....	1.58	1.27	.86	61	49	33	-----	-----
Whooping cough (9).....	19.17	9.11	8.61	739	351	139	2	27
Mumps (13).....	12.09	10.28	7.58	466	400	292	9	1
Chickenpox (part 25).....	15.46	11.99	8.43	596	462	325	8	6
Scarlet fever (8).....	6.02	5.86	5.60	232	226	216	3	12
Diphtheria (10).....	1.82	1.79	1.79	70	69	69	-----	7
Poliomyelitis, acute anterior (part 22).....	.18	.18	.18	7	7	7	-----	2
Erysipelas (21).....	.67	.60	.57	26	23	22	-----	-----
Tuberculosis, non-respiratory (32-37).....	.78	.62	.54	30	24	21	3	19
Syphilis (38).....	.67	.18	.10	26	7	4	2	15
Gonorrhœa (40).....	.36	.16	.16	14	6	6	-----	4
General infection, blood poisoning (part 41).....	.80	.67	.49	31	26	19	7	2
Local infection (cause unknown) (part 41).....	5.24	2.93	1.92	202	113	74	5	2
Vaccinia (excl. of vaccinations without illness) (part of 42).....	1.97	1.87	1.32	76	72	51	-----	1
Other diseases of this group.....	1.32	.88	.78	51	34	30	2	8
<b>Other general diseases (43-69):</b>								
Cancer (43-49).....	1.35	1.01	.93	52	39	36	-----	30
Benign tumors, exclusive of female organs (50).....	3.29	1.25	.91	127	48	35	10	21
Rheumatism, acute and chronic (51, 52).....	11.39	6.20	5.32	439	239	205	44	117
Diabetes (57).....	1.87	.91	.83	72	35	32	2	53
Anemia, all forms (58).....	3.79	1.32	.99	146	51	38	30	44
Diseases of the thyroid gland (60).....	3.48	1.06	.96	134	41	37	8	84
Acidosis (part 69).....	1.82	.73	.65	70	28	25	8	7
Other general diseases.....	2.62	1.27	1.25	101	49	48	12	27
<b>Diseases of the nervous system (70-84):</b>								
Cerebral hemorrhage, apoplexy (74).....	.83	.80	.80	32	31	31	8	7
Paralysis (75).....	.86	.57	.47	33	22	18	6	21
Epilepsy (78).....	.67	.29	.21	26	11	8	2	22
Convulsions (79, 80).....	1.25	.96	.91	48	37	35	7	1
Chorea (81).....	.42	.29	.23	16	11	9	1	5
Neuralgia and neuritis (82).....	6.98	3.11	2.39	269	120	92	25	45

<sup>1</sup> Causing loss of one or more days from school or usual occupation whether or not gainfully employed. All cases with one or more days in bed are assumed to be disabling.

**TABLE 12.—Morbidity from certain diseases in canvassed white families in 18 States during 12 consecutive months, 1928–1931—Continued**

Diagnoses, with the International List numbers, 1920 revision	Annual case rate per 1,000 persons observed			Number of cases				
	Sole, primary, or contributory			Sole, primary, or contributory			Contributory to some other diagnosis	Onset of illness was prior to study year
	Total	Disabling	In bed	Total	Disabling	In bed		
<b>Diseases of the nervous system—Contd.</b>								
Nervousness (part 84).....	6.46	2.10	1.71	249	81	66	23	43
Neurasthenia, nervous breakdown (part 84).....	3.06	2.05	1.71	118	79	66	9	15
Other nervous diseases.....	2.57	1.58	1.38	99	61	53	15	50
<b>Diseases of the eyes and annexa (85):</b>								
Sty (part 85).....	1.66	.44	.16	64	17	6	3	1
Conjunctivitis, pinkeye, sore eye (part 85).....	5.40	2.54	.42	268	98	16	6	.....
Other eye conditions.....	4.57	1.35	.73	176	52	28	12	38
<b>Diseases of ears and mastoid process (86):</b>								
Karache (part 86).....	4.00	1.89	1.22	154	73	47	39	1
Otitis media (part 86).....	13.44	8.39	6.88	518	320	265	107	8
Other ear conditions (part 86).....	4.75	1.50	1.12	183	58	43	30	22
Diseases of mastoid process (part 86).....	1.35	1.25	1.25	52	48	48	8	7
<b>Diseases of the circulatory system (87–96):</b>								
Diseases of the heart (87–90).....	8.72	5.84	5.06	336	225	195	52	153
Hemorrhoids (part 93).....	2.88	1.06	.86	111	41	33	8	20
Varicose veins or ulcer (part 93).....	1.32	.44	.34	51	17	13	5	24
Diseases of lymphatic system (94).....	6.02	3.81	3.22	232	147	124	52	5
Nose bleed, epistaxis (part 95).....	.86	.36	.18	33	14	7	8	.....
Arteriosclerosis and high blood pressure (part 91, part 96).....	4.80	2.44	2.39	185	94	92	55	85
Other circulatory diseases.....	2.08	1.14	1.12	80	44	43	22	19
<b>Diseases of the teeth and gums (part of 108).....</b>	11.62	3.24	2.23	448	125	86	40	17
<b>Diseases of the digestive system (part of 108, 110–127):</b>								
Diseases of mouth except teeth and gums (part of 108).....	1.58	.42	.34	61	16	13	5	3
Ulcers of stomach and duodenum (111).....	1.97	1.22	.99	76	47	38	.....	27
Indigestion, upset stomach, nausea (part of 112).....	31.81	17.90	15.18	1,226	690	585	57	26
Biliousness (part of 205).....	3.76	2.80	2.52	145	108	97	7	1
Other and ill-defined stomach conditions (part of 112).....	6.17	2.67	1.92	238	103	74	16	45
Diarrhea and enteritis (113, 114).....	21.51	12.40	11.47	929	478	442	34	25
Intestinal parasites except hookworm (116).....	1.12	.34	.26	43	13	10	1	3
Appendicitis (117).....	9.13	8.12	7.94	352	313	306	29	20
Hernia, intestinal obstruction (118).....	2.75	1.79	1.69	106	69	65	5	26
Constipation (part of 119).....	2.39	.52	.34	92	20	13	6	32
Biliary calculi (123).....	1.09	.91	.91	42	35	35	1	4
Cholecystitis (part of 124).....	3.71	2.49	2.31	143	96	89	5	30
Jaundice (part of 124).....	.80	.52	.42	31	20	16	3	.....
Other and ill-defined liver conditions (part of 124).....	1.25	.60	.39	48	23	15	4	12
Other and ill-defined diseases of digestive system.....	2.85	2.08	1.92	110	80	74	14	13
<b>Diseases of kidneys and urinary system (128–134):</b>								
Nephritis, acute and chronic (128, 129).....	2.08	1.53	1.40	80	59	54	12	23
Kidney trouble, unqualified (part of 131).....	3.94	1.97	1.43	152	76	55	27	25
Pyelitis (part of 131).....	2.41	1.58	1.43	93	61	55	8	6
Other kidney conditions (part of 131).....	.83	.49	.44	32	19	17	6	6
Calculi of urinary passages (132).....	1.17	1.96	.86	45	37	33	.....	3
Cystitis (part of 133).....	2.93	1.32	1.01	113	51	39	10	14
Other diseases of bladder, diseases of urethra (part of 133, 134).....	2.08	.67	.52	80	26	20	8	24
<b>Nonvenereal diseases of genital organs and annexa (135–142):</b>								
Diseases of the prostate (135).....	.80	.47	.42	31	18	16	5	6
Circumcision (part 136).....	2.46	1.95	1.89	95	75	73	15	2
Nonvenereal diseases of male genital organs (part 136).....	.52	.21	.16	20	8	6	2	1
Cysts and tumors of ovary and uterus (137, 139).....	1.19	.99	.99	46	38	38	4	14
Salpingitis and pelvic abscess (138).....	.83	.70	.70	32	27	27	7	4
Menstrual disorders (140, part 141).....	5.99	3.22	2.91	231	124	112	15	40

TABLE 12.—Morbidity from certain diseases in canvassed white families in 18 States during 12 consecutive months, 1928-1931—Continued

Diagnoses, with the International List numbers, 1920 revision	Annual case rate per 1,000 persons observed			Number of cases				
	Sole, primary, or contributory			Sole, primary, or contributory			Contributory to some other diagnosis	Onset of illness was prior to study year
	Total	Disabling	In bed	Total	Disabling	In bed		
<b>Nonvenereal diseases of genital organs and annexa—Continued.</b>								
Other and ill-defined nonvenereal diseases of female organs (part 141, 142).....	5.71	2.65	2.44	220	102	94	18	44
<b>Puerperal state, including chronic conditions resulting from childbirth (143-180):</b>								
Abortions, miscarriages and stillbirths (part 143).....	3.87	3.84	3.79	149	148	146	4	7
Live births (part 145, 149).....	19.74	19.74	19.74	761	761	761	-----	9
Disturbances of pregnancy without loss of fetus (part 143).....	.54	.39	.39	21	15	15	-----	-----
Acute complications of pregnancy or childbirth (144, 146, 147, 148, part 149).....	.62	.54	.54	24	21	21	16	8
Puerperal diseases of the breast (160).....	.99	.62	.62	38	24	24	5	1
Lacerations, displacements, etc.: Due or aggravated by births during study (part 145).....	.47	.29	.29	18	11	11	4	-----
Results of births prior to study (part 145, part 149).....	2.65	1.25	1.17	102	48	45	32	52
<b>Diseases of skin and cellular tissue (151-154):</b>								
Furuncle (152).....	8.28	2.78	1.53	319	107	59	9	5
Abscesses and ulcers (153, part 154).....	3.29	1.70	1.27	127	69	49	10	10
Impetigo (part 154).....	3.74	1.01	.13	144	39	5	6	5
Urticaria, hives (part 154).....	1.79	.73	.60	69	28	23	7	2
Scabies (part 154).....	2.88	1.17	.10	111	45	4	-----	5
Eczema (part 154).....	4.15	.75	.29	160	29	11	6	32
Other and ill-defined skin conditions.....	12.06	2.62	1.32	465	101	51	16	49
<b>Diseases of bones and organs of locomotion (155-158):</b>								
Diseases of bones and joints, except tuberculosis and rheumatism (155, 156).....	2.13	.91	.75	82	35	29	8	22
Lumbago (part 158).....	3.27	2.15	1.61	126	83	62	4	2
Wry neck, myalgia, myositis, and other muscular pains (part 156).....	1.06	.26	.23	41	10	9	5	2
Ill-defined orthopedic conditions (part 205).....	1.71	.75	.54	66	29	21	2	45
Other diseases of the organs of locomotion.....	3.04	.75	.44	117	29	17	3	34
<b>Congenital malformations and other diseases of early infancy (159-163):</b>								
Congenital malformations (160).....	1.17	.54	.49	45	21	19	-----	18
Other diseases of early infancy (160-163).....	1.01	.80	.80	39	31	31	5	3
<b>Accidents and other external causes (165-203):</b>								
Poisoning by ivy, oak, and other plants (part 177).....	2.49	.88	.44	96	34	17	-----	-----
Other accidental poisonings (175, 176, part 177).....	3.09	1.69	1.50	119	65	58	-----	-----
Automobile accidents (188c).....	4.96	4.02	3.55	191	155	137	-----	9
Accidental burns (179).....	4.02	1.58	.91	156	61	35	2	1
Accidental injuries by cutting or piercing instruments (184).....	7.60	2.88	1.58	293	111	61	-----	2
Accidental falls (185).....	5.11	2.46	1.76	197	95	68	2	1
Other accidental injuries.....	47.45	22.52	12.69	1,829	368	499	5	28
Homicides and attempted homicides (197-200).....	.05	.03	.03	2	1	1	-----	-----
Suicides and attempted suicides (165-174).....	.13	.10	.10	5	4	4	-----	-----
<b>Other and ill-defined causes (164, 204, 205):</b>								
Foot trouble (part 205).....	2.70	-----	-----	104	-----	-----	-----	2
Headache (part 205).....	6.30	3.55	2.91	243	137	112	7	17
Backache (part 205).....	2.75	.86	.57	106	33	22	4	6
Debility, fatigue, exhaustion, malnutrition, loss of weight (part 205).....	6.62	1.87	1.43	255	72	55	20	47
Rash, unqualified (part 205).....	2.75	.96	.75	106	37	29	9	1
Other and unknown causes of sickness.....	11.67	4.20	3.55	450	162	137	27	59

Three of the four most frequent specific causes of illness are respiratory. For conditions other than respiratory, accidental injuries head the list, and indigestion and other stomach disorders come next to respiratory conditions among diseases exclusive of accidents. Next to indigestion but with considerably smaller rates come measles, confinements,<sup>2</sup> and ear diseases, with almost identical rates for the three. Figure 3, it must be remembered, is based solely on the *frequency* of cases, and serious conditions like pneumonia, heart diseases, kidney diseases, appendicitis, etc., fall rather far down in the list. The chart does not show the seriousness of a case but merely the frequency with which it occurred. Later studies will consider the severity of these diseases as measured in days of illness, days in bed, the extent and kind of medical care, etc.

With respect to the incidence of the communicable diseases of children, such as measles, whooping cough, etc., a 12-month record ordinarily would not give any indication of the expected frequency of such conditions, because they vary widely from year to year. However, these data come from 130 different localities, and the high epidemic rates in one place would be averaged with the low rates of another, because the cyclical waves in the incidence of these diseases do not occur synchronously in different communities. The rates for such conditions in this study will therefore approach the true average expectancy much closer than in a 12-month period in a single locality.

Ninth in the list of diseases, with a rate of 23 per 1,000, is a group of rheumatic and neuralgic conditions. Technically, the diagnoses included in this category differ a great deal, but it was felt that as reported by lay persons the most accurate statement of their frequency would be obtained by combining similar aches and pains into one group. Table 12 shows these and other diagnoses separately and in greater detail than is shown in the graphs, and the composition of the group can be obtained from that source.

In Figure 4 there is eliminated from consideration all illnesses that were so mild that they did not keep the patient from his usual duties, but the chart is still based on the *frequency* of cases and in no way represents the severity of an individual diagnosis. The purpose of setting up this new alignment of cases according to frequency was to indicate the chief causes of illness of sufficient severity to involve loss of time from work, school, play, or other occupation, particularly

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<sup>2</sup> In this paper all rates are expressed as per 1,000 *total* population. In many instances the cases of a specific diagnosis are limited almost solely to certain groups of the population. Examples are the communicable diseases of children that occur largely under 15 years of age, and confinements, miscarriages, and abortions that occur almost entirely among married women under 50 years of age. The purpose of the rates in the present paper is to measure the importance of a specific condition not to any subgroup of the population but to the whole population, and the proper base for the rates, therefore, seems to be the total population of both sexes. Later papers will consider rates for various subgroups of the population.

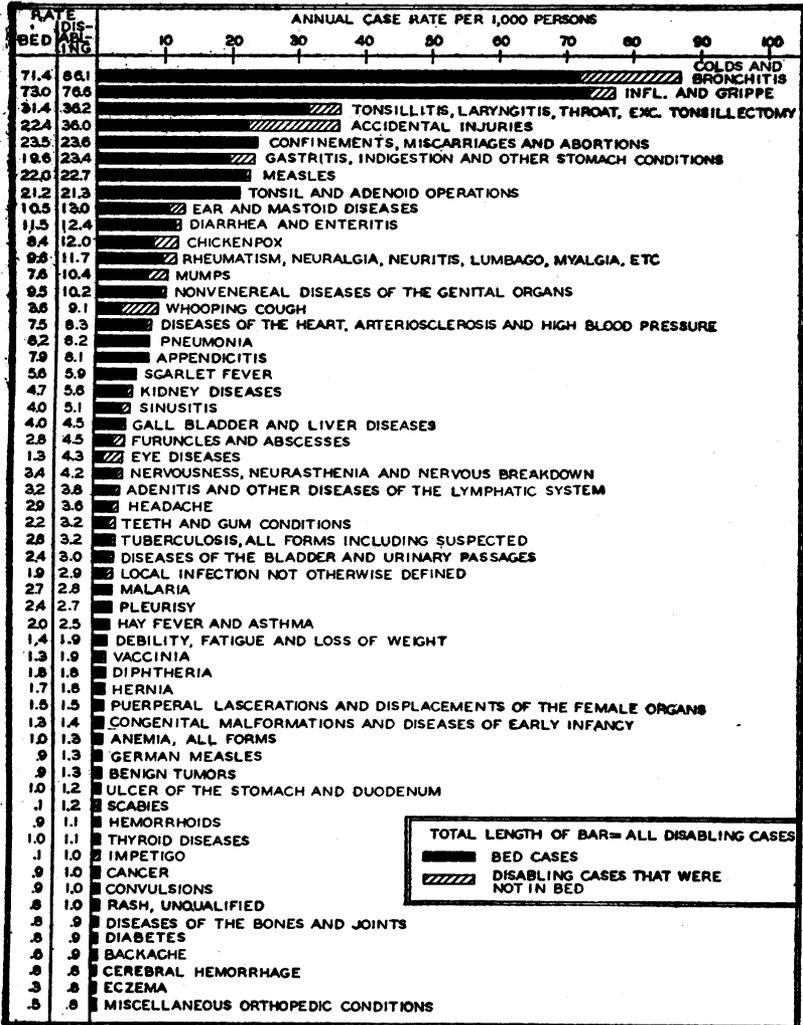


FIGURE 4.—Annual incidence of disabling and of bed cases of illness in surveyed families in 18 States, 1928-1931. (Primary and contributory causes)

because it was felt that in a survey of this kind practically all of such cases would be reported to the investigators. In this chart the bars representing case rates have been shaded in two ways, the black portion of the bar representing the frequency of cases that caused the patient to go to bed for one or more days, and the cross-hatched portion the frequency of disabling cases that did not cause the patient to go to bed. The total length of the bar, therefore, represents the rate for all disabling cases whether or not the patient was in bed. It will be noted that in the majority of diagnoses nearly all of the bar is black, which indicates that the number of disabling cases in which the patient was not in bed for one or more days is small. Figure 4 shows sickness-frequency rates for all specific causes having a rate of 0.75 or higher per 1,000 for disabling cases.

In spite of the usual designation of "minor" respiratory diseases, the three most frequent diagnoses for disabling illness and for illness with one or more days in bed are in the minor respiratory class. The fourth most frequent disabling condition is accidents; but in terms of cases in which the patient was in bed, this cause is exceeded by confinements. Indigestion, measles, and tonsil and adenoid operations are the other three diagnoses with rates for disabling cases above 20 per 1,000, with the next rate, ear and mastoid conditions, at 13 per 1,000.

#### SUMMARY

A total of 8,758 white families in 130 localities in 18 States were observed for illness for a period of 12 consecutive months between February, 1928, and June, 1931. Each family was visited at intervals of 2 to 4 months to obtain the sickness record.

The surveyed families include representation from nearly all geographic sections, from rural, urban, and metropolitan areas, from all income classes, and of both native- and foreign-born persons. The proportions of these various elements included are not identical with those included in the population of the United States, but the variations are not generally large. In other respects also the surveyed group is not dissimilar to families in the general white population of the United States.

An illness rate of 850 per 1,000 persons was found. Although considerably less than the Hagerstown rate of 1,081 per 1,000, the difference is largely in the minor respiratory conditions, nearly all of the nonrespiratory disease groups having a higher rate in the present study than in the Hagerstown data. (Fig. 2.)

Records obtained at intervals of 2 to 4 months could not be expected to contain all the minor respiratory and digestive illnesses, but might be expected to be reasonably complete for all cases causing loss of time from work or school or causing the patient to go to bed.

For this reason, rates were computed to show the frequency of these types of cases independent of the total cases reported.

Illnesses that caused loss of time from work, school, or other occupation amounted to 516 per 1,000 persons.

Illnesses in which the patient was confined to bed for one or more days amounted to 434 per 1,000 persons. This figure is almost identical with the finding of the Hagerstown study.

Minor respiratory conditions are the most frequent causes of illness, whether one considers the total rate (fig. 3), the rate for disabling cases, or the rate for bed cases (fig. 4).

#### REFERENCES

- (1) Annual summaries of the notifiable diseases in States, large cities, and small cities. Public Health Reports and Supplements.
- (2) Brundage, Dean K.: *Sickness among industrial employees*. Pub. Health Rep., Jan. 23, 1926 (Reprint 1060) and Jan. 17, 1930 (Reprint 1347), and later.
- (3) ———: A 10-year record of absences from work on account of sickness and accidents. Pub. Health Rep., Feb. 25, 1927. (Reprint 1142.)
- (4) Collins, Selwyn, D.: *The health of the school child*. Pub. Health Bul. No. 200 (1931). (Other references included in bibliography.)
- (5) ———: *Influenza-pneumonia mortality in a group of about 95 cities in the United States, 1920-1929*. Pub. Health Rep., Feb. 21, 1930. (Reprint 1355.)
- (6) DePorte, J. V.: *Sickness in Essex County*. New York State Journal of Medicine, Nov. 1, 1929. *Sickness in Rural New York*. Journal of the American Medical Association, Feb. 16, 1929.
- (7) Downes, Jean.: *Sickness records in school hygiene*. Am. Jour. Pub. Health, November, 1930.
- (8) Falk, I. S., Klem, Margaret C., and Sinai, N.: *The incidence of illness and receipt and costs of medical care among representative families*. Publication No. 26 of the Committee on the Costs of Medical Care. University of Chicago Press. (1933.)
- (9) Nesbit, O. B.: *Sickness and absence records in the school health program*. Transactions of the Fifth Annual Meeting, American Child Health Association, 1928, p. 128.
- (10) Stecker, Margaret L.: *Some recent morbidity data*. Metropolitan Life Insurance Company, 1919.
- (11) Sydenstricker, Edgar: *A study of illness in a general population group*. Pub. Health Rep., Sept. 24, 1926 (Reprint 1133) and ten other papers in the Public Health Reports, 1926-1929.
- (12) Wilson, Charles C., Hiscock, Ira V., Watkins, J. H., and Case, Jarvis D.: *A study of illness among grade school children*. Pub. Health Rep., July 31, 1931.

## COURT DECISION RELATING TO PUBLIC HEALTH

*Action for carbon bisulphide poisoning held barred by statute of limitations.*—(Washington Supreme Court; *Calhoun v. Washington Veneer Co.*, 15 P. (2d) 943; decided Nov. 15, 1932.) An action was brought to recover damages on account of carbon disulphide poisoning-alleged to have been caused by employment in a room improperly ventilated in violation of the factory act. The supreme court stated that, in the condition of the law at the time, recovery could be had, if at all, only under the factory act. The employee's cause of action was held to have accrued when he ceased working in the room alleged to have been improperly ventilated and, because his action was not commenced within the period prescribed by the statute of limitations, the court held that it was barred. After the commencement of his action the employee died, and the causes of action set up by the administratrix of his estate were also held to be barred.

## DEATHS DURING WEEK ENDED MARCH 4, 1933

[From the Weekly Health Index issued by the Bureau of the Census, Department of Commerce]

	Week ended Mar. 4, 1933	Correspond- ing week, 1932
<b>Data from 85 large cities of the United States:</b>		
Total deaths.....	8, 229	9, 370
Deaths per 1,000 population, annual basis.....	11.5	13.4
Deaths under 1 year of age.....	609	694
Deaths under 1 year of age per 1,000 estimated live births <sup>1</sup> .....	83	90
Deaths per 1,000 population, annual basis, first 9 weeks of year.....	12.5	12.3
<b>Data from industrial insurance companies:</b>		
Policies in force.....	68, 947, 917	73, 926, 205
Number of death claims.....	15, 423	15, 816
Death claims per 1,000 policies in force, annual rate.....	11.7	11.2
Death claims per 1,000 policies, first 9 weeks of year, annual rate.....	11.4	10.0

1933, 81 cities; 1932, 78 cities.

# PREVALENCE OF DISEASE

*No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring*

## UNITED STATES

### CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks ended March 11, 1933, and March 12, 1932

*Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended March 11, 1933, and March 12, 1932*

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 11, 1933	Week ended Mar. 12, 1932	Week ended Mar. 11, 1933	Week ended Mar. 12, 1932	Week ended Mar. 11, 1933	Week ended Mar. 12, 1932	Week ended Mar. 11, 1933	Week ended Mar. 12, 1932
<b>New England States:</b>								
Maine.....		2	1	17	2	445	0	0
New Hampshire.....		2	3			13	0	0
Vermont.....	1				21	32	0	0
Massachusetts.....	28	29	11	43	355	481	0	0
Rhode Island.....	2	3	5			451	0	2
Connecticut.....	5	1	7	28	328	236	2	0
<b>Middle Atlantic States:</b>								
New York.....	70	124	130	1324	3,519	2,643	7	8
New Jersey.....	23	39	34	266	1,594	188	2	1
Pennsylvania.....	78	131			1,242	1,925	7	5
<b>East North Central States:</b>								
Ohio.....	43	64	215	492	529	1,879	0	2
Indiana.....	42	64	83	200	85	45	3	10
Illinois.....	31	88	68	190	276	252	19	10
Michigan.....	19	33	9	146	1,531	602	7	2
Wisconsin.....	5	13	137	874	412	418	1	3
<b>West North Central States:</b>								
Minnesota.....	5	9	2		1,102	14	0	0
Iowa.....	12	14			14		2	3
Missouri.....	27	32	17	10	243	83	4	0
North Dakota.....	7	1	26		18	25	1	4
South Dakota.....	5	4		10	6	15	0	2
Nebraska.....	7	11	3	4	22	38	1	0
Kansas.....	4	15	6	9	237	126	4	0
<b>South Atlantic States:</b>								
Delaware.....	1	1		3	2		0	0
Maryland.....	8	26	70	219	6	80	0	2
District of Columbia.....	3	9	3	14	5	1	0	3
Virginia.....	18				647		2	
West Virginia.....	12	18	43	375	166	626	0	2
North Carolina.....	12	29	105	76	371	439	2	3
South Carolina.....	5	8	918	993	204	95	0	0
Georgia.....	8	7	445	185	29	22	2	0
Florida.....	7		13	2	25	1	0	0
<b>East South Central States:</b>								
Kentucky.....	13	11	77	384	67	76	2	1
Tennessee.....	9	19	85	1,493	33	182	8	3
Alabama.....	15	24	113	87	41	5	1	0
Mississippi.....	7	10					1	0
<b>West South Central States:</b>								
Arkansas.....	4	4	49	144	119	1	2	1
Louisiana.....	23	31	56	12	40	18	1	0
Oklahoma.....	21	22	141	776	71	24	0	1
Texas.....	43	59	135	410	710	26	1	0

See footnotes at end of table

*Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended March 11, 1933, and March 12, 1932—Continued*

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar. 11, 1933	Week ended Mar. 12, 1932	Week ended Mar. 11, 1933	Week ended Mar. 12, 1932	Week ended Mar. 11, 1933	Week ended Mar. 12, 1932	Week ended Mar. 11, 1933	Week ended Mar. 12, 1932
<b>Mountain States:</b>								
Montana.....		2	15	182	94	81	0	1
Idaho.....	1		3	2	94	1	0	0
Wyoming.....		2	1	1	1	2	0	0
Colorado.....	2	7	47		3	145	7	1
New Mexico.....	11	16	2	3	12	121	1	1
Arizona.....	3	1		117	34	2	0	2
Utah.....	1	1	5		4		2	0
<b>Pacific States:</b>								
Washington.....	4	7			3	549	0	1
Oregon.....	3	1	73	233	108	160	0	0
California.....	49	49	107	170	985	517	3	4
<b>Total.....</b>	<b>702</b>	<b>1,043</b>	<b>3,163</b>	<b>8,494</b>	<b>15,410</b>	<b>13,085</b>	<b>95</b>	<b>78</b>
Division and State	Pollomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar. 11, 1933	Week ended Mar. 12, 1932	Week ended Mar. 11, 1933	Week ended Mar. 12, 1932	Week ended Mar. 11, 1933	Week ended Mar. 12, 1932	Week ended Mar. 11, 1933	Week ended Mar. 12, 1932
<b>New England States:</b>								
Maine.....	0	0	14	35	0	9	2	0
New Hampshire.....	0	0	50	32	0	0	1	0
Vermont.....	0	0	15	22	0	6	0	0
Massachusetts.....	1	1	392	499	0	0	0	2
Rhode Island.....	0	0	26	53	0	0	0	0
Connecticut.....	0	0	115	109	0	4	1	1
<b>Middle Atlantic States:</b>								
New York.....	0	1	1,009	1,821	0	2	10	7
New Jersey.....	0	2	382	334	0	0	4	1
Pennsylvania.....	0	0	956	747	0	0	9	6
<b>East North Central States:</b>								
Ohio.....	0	0	967	487	2	27	8	3
Indiana.....	0	1	197	193	1	13	1	4
Illinois.....	1	0	471	306	26	34	1	3
Michigan.....	1	1	558	400	2	8	4	7
Wisconsin.....	0	1	160	102	9	0	1	11
<b>West North Central States:</b>								
Minnesota.....	0	1	88	110	0	2	0	1
Iowa.....	0	0	53	63	49	20	1	3
Missouri.....	0	0	95	85	0	7	1	4
North Dakota.....	0	0	21	25	5	2	1	0
South Dakota.....	1	0	24	13	0	0	3	1
Nebraska.....	0	0	37	38	0	12	0	3
Kansas.....	9	0	38	35	1	2	2	3
<b>South Atlantic States:</b>								
Delaware.....	0	0	15	15	0	0	0	1
Maryland.....	1	0	113	132	0	0	14	4
District of Columbia.....	0	0	21	24	0	0	0	3
Virginia.....	1		59		4	1	8	
West Virginia.....	0	1	94	29	0	4	4	12
North Carolina.....	1	0	81	54	0	1	3	7
South Carolina.....	0	1	8	7	0	0	9	2
Georgia.....	0	0	0	2	14	0	3	10
Florida.....	1	0	3	2	0	0	0	5
<b>East South Central States:</b>								
Kentucky.....	0	0	60	76	0	0	9	9
Tennessee.....	1	0	40	31	0	7	5	9
Alabama.....	0	0	14	15	1	8	1	13
Mississippi.....	1	0	5	6	0	17	5	5
<b>West South Central States:</b>								
Arkansas.....	0	0	19	2	22	27	1	0
Louisiana.....	0	0	13	16	0	2	5	13
Oklahoma.....	1	0	31	32	9	12	0	4
Texas.....	0	0	44	38	9	46	8	4

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended March 11, 1933, and March 12, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar. 11, 1933	Week ended Mar. 12, 1932	Week ended Mar. 11, 1933	Week ended Mar. 12, 1932	Week ended Mar. 11, 1933	Week ended Mar. 12, 1932	Week ended Mar. 11, 1933	Week ended Mar. 12, 1932
<b>Mountain States:</b>								
Montana.....	0	0	16	17	1	0	7	4
Idaho.....	0	0	0	2	4	0	0	0
Wyoming.....	0	0	4	2	0	1	0	0
Colorado.....	0	0	43	33	1	2	1	0
New Mexico.....	0	0	8	10	0	0	0	1
Arizona.....	0	1	8	3	0	1	0	0
Utah <sup>1</sup> .....	0	0	19	119	0	0	1	0
<b>Pacific States:</b>								
Washington.....	0	0	52	26	4	10	3	0
Oregon.....	0	0	10	26	2	11	2	2
California.....	2	6	217	139	39	13	9	7
<b>Total.....</b>	<b>13</b>	<b>17</b>	<b>6,587</b>	<b>6,440</b>	<b>205</b>	<b>292</b>	<b>139</b>	<b>176</b>

<sup>1</sup> New York City only.

<sup>2</sup> Week ended Friday.

<sup>3</sup> Typhus fever, week ended Mar. 11, 1933, 8 cases: 1 case in South Carolina, 3 cases in Georgia, 2 cases in Alabama, and 2 cases in Texas.

<sup>4</sup> Figures for 1933 are exclusive of Oklahoma City and Tulsa and for 1932 are exclusive of Tulsa only.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week:

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
<i>January, 1933</i>										
California.....	18	236	2,780	1	652	2	9	789	111	37
Delaware.....		21	78		5		0	46	0	
District of Columbia.....	4	37	45		13	1	0	86	0	1
Mississippi.....	3	319	11,369	354	757	147		46	7	18
South Carolina.....		143	13,534	437	156	150	2	29	9	12
South Dakota.....	4	20	878		31	0	0	90	11	270
<i>February, 1933</i>										
Colorado.....	11	16	330		27		0	154	0	2
Connecticut.....	4	20	345	1	661		0	483	6	3
Delaware.....	1	17	21		13		0	31	0	
Massachusetts.....	1	96	105	2	962	1	1	1,499	0	4
New Mexico.....	1	44	89		24		0	46	0	5
Vermont.....		12			17		0	77	2	2

<i>January, 1933</i>		Dysentery:	Cases	Mumps:	Cases
Actinomycosis:	Cases	California (amebic).....	3	California.....	539
California.....		California (bacillary).....	12	Delaware.....	6
South Dakota.....	1	Mississippi (amebic).....	50	Mississippi.....	209
Botulism:		Food poisoning:		South Carolina.....	60
California.....	2	California.....	12	South Dakota.....	8
Chicken pox:		German measles:		Ophthalmia neonatorum:	
California.....	1,793	California.....	24	California.....	2
Delaware.....	50	Granuloma, coccidioidal:		Mississippi.....	11
District of Columbia.....	128	California.....	4	South Carolina.....	20
Mississippi.....	441	Hookworm disease:		Paratyphoid fever:	
South Carolina.....	216	Mississippi.....	387	South Carolina.....	2
South Dakota.....	82	South Carolina.....	93	Puerperal septicemia:	
Dengue:		Leprosy:		Mississippi.....	24
Mississippi.....	5	California.....	1	Rabies in animals:	
South Carolina.....	15	Lethargic encephalitis:		California.....	39
Diarrhea:		California.....	3	Delaware.....	3
South Carolina.....	329	South Carolina.....	7	Mississippi.....	13
				South Carolina.....	11

Rabies in man:	Cases	Chicken pox:	Cases	Rabies in animals:	Cases
South Dakota.....	1	Colorado.....	316	Connecticut.....	4
Septic sore throat:		Connecticut.....	411	Colorado.....	1
California.....	12	Delaware.....	53	Connecticut.....	3
South Dakota.....	3	Massachusetts.....	1,106	Massachusetts.....	40
Tetanus:		New Mexico.....	105	Tetanus:	
California.....	3	Vermont.....	216	Connecticut.....	1
Trachoma:		Conjunctivitis:		Trachoma:	
California.....	9	New Mexico.....	5	Connecticut.....	1
Mississippi.....	6	Dysentery:		Colorado.....	1
South Dakota.....	3	Connecticut (bacillary).....	5	Massachusetts.....	4
Trichinosis:		German measles:		New Mexico.....	1
California.....	3	Connecticut.....	12	Trichinosis:	
Tularaemia:		Massachusetts.....	51	Connecticut.....	3
Mississippi.....	1	New Mexico.....	5	Massachusetts.....	21
South Carolina.....	4	Impetigo contagiosa:		Delaware.....	3
Typhus fever:		Colorado.....	1	Undulant fever:	
California.....	2	Lead poisoning:		Connecticut.....	4
Delaware.....	1	Connecticut.....	1	Vermont.....	1
South Carolina.....	3	Massachusetts.....	1	Vincent's angina:	
Undulant fever:		Lethargic encephalitis:		Colorado.....	2
California.....	4	Connecticut.....	2	New Mexico.....	3
Delaware.....	1	Massachusetts.....	4	Whooping cough:	
Mississippi.....	2	Mumps:		Colorado.....	53
South Carolina.....	1	Colorado.....	382	Connecticut.....	270
Whooping cough:		Connecticut.....	251	Delaware.....	1
California.....	1,059	Delaware.....	1	Massachusetts.....	732
Delaware.....	3	Massachusetts.....	718	New Mexico.....	25
District of Columbia.....	16	New Mexico.....	103	Vermont.....	86
Mississippi.....	583	Vermont.....	297		
South Carolina.....	153	Ophthalmia neonatorum:			
South Dakota.....	62	Connecticut.....	1		
		Massachusetts.....	44		
		New Mexico.....	1		
February, 1933		Puerperal septicemia:			
Anthrax:		Delaware.....	1		
Massachusetts.....	3				

WEEKLY REPORTS FROM CITIES

City reports for week ended March 4, 1933

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Small pox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
<b>Maine:</b>											
Portland.....	0	1	0	1	2	0	0	0	0	18	26
<b>New Hampshire:</b>											
Concord.....	0		0	0	1	0	0	0	0	0	11
Nashua.....	0		0	1	0	0	0	0	0	0	
<b>Vermont:</b>											
Barre.....	0		0	0	0	0	0	1	0	7	2
Burlington.....	0		0	0	0	1	0	0	0	0	14
<b>Massachusetts:</b>											
Boston.....	3	2	3	54	14	85	0	11	0	85	235
Fall River.....	1		0	0	3	18	0	1	0	8	36
Springfield.....	1		0	2	1	18	0	1	0	12	37
Worcester.....	0		1	1	4	22	0	2	0	9	49
<b>Rhode Island:</b>											
Pawtucket.....	0		0	0	1	0	0	0	0	0	14
Providence.....	1	4	1	0	3	16	0	4	0	28	66
<b>Connecticut:</b>											
Bridgeport.....	0	3	1	23	1	13	0	2	0	0	31
Hartford.....	0	1	0	5	3	11	0	1	0	2	43
New Haven.....	0		2	0	3	3	0	0	0	10	44
<b>New York:</b>											
Buffalo.....	10		1	12	25	46	0	7	0	23	146
New York.....	40	53	18	1,725	189	313	0	95	5	105	1,591
Rochester.....	0		3	1	8	29	0	4	0	14	85
Syracuse.....	1		0	1	6	35	0	1	0	11	52
<b>New Jersey:</b>											
Camden.....	5		0	0	6	8	0	1	0	0	18
Newark.....	0	15	0	486	8	46	0	4	0	26	83
Trenton.....	1	2	1	6	4	18	0	1	0	1	36
<b>Pennsylvania:</b>											
Philadelphia.....	5	12	5	92	44	131	0	34	1	5	517
Pittsburgh.....	6	5	2	7	18	51	0	5	0	82	154
Reading.....	0		0	87	2	16	0	1	0	7	20
<b>Ohio:</b>											
Cincinnati.....	2	1	1	0	17	25	0	7	0	4	159
Cleveland.....	6	68	2	1	12	184	0	14	0	35	178
Columbus.....	0		0	63	6	3	0	0	0	0	78
Toledo.....	4	2	0	176	9	60	0	6	0	8	75

City reports for week ended March 4, 1933—Continued

State and city	Diphtheria cases		Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Small-pox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
	Cases	Deaths	Cases	Deaths								
<b>Indiana:</b>												
Fort Wayne.....	3		1	0	1	1	0	1	0	0	0	23
Indianapolis.....	4		1	30	9	26	0	4	0	0	3	
South Bend.....	0		0	0	4	7	0	0	0	0	7	15
Terre Haute.....	0		0	17	2	7	0	2	0	0	0	25
<b>Illinois:</b>												
Chicago.....	5	5	13	223	75	244	0	35	0	14	758	
Springfield.....	1	2	0	0	2	4	0	1	0	3	23	
<b>Michigan:</b>												
Detroit.....	12	1	1	362	22	161	0	11	0	120	233	
Flint.....	1	12	0	32	5	3	0	1	0	4	31	
Grand Rapids.....	0		1	4	3	11	0	0	0	51	25	
<b>Wisconsin:</b>												
Kenosha.....	0		0	0	0	0	9	0	0	19	6	
Madison.....	0			76		6	0	0	0	8		
Milwaukee.....	1		0	3	2	40	0	5	0	73	83	
Racine.....	2		0	1	0	9	0	0	0	12	10	
Superior.....	0		0	0	0	0	0	0	0	4	3	
<b>Minnesota:</b>												
Duluth.....	0		0	8	3	5	0	1	0	49	19	
Minneapolis.....	1		0	1,019	5	27	0	2	0	8	80	
St. Paul.....	2		0	342	6	15	0	0	1	51	57	
<b>Iowa:</b>												
Des Moines.....	4			1		2	0		0	1	35	
Sioux City.....	0			1		1	0		0	4		
Waterloo.....	0			0		1	0		0	1		
<b>Missouri:</b>												
Kansas City.....	2		1	234	25	48	0	0	0	4	123	
St. Joseph.....	0		0	4	4	1	0	0	0	7	29	
St. Louis.....	20	1	3	17	9	31	0	9	1	2	222	
<b>North Dakota:</b>												
Fargo.....	0		0	1	1	2	0	0	0	0	4	
Grand Forks.....	1		0	0	0	2	0	0	0	0		
<b>South Dakota:</b>												
Aberdeen.....	0		0	1	0	5	2	0	0	0	0	
Sioux Falls.....	0		0	3	0	0	0	0	0	0	9	
<b>Nebraska:</b>												
Omaha.....	5		0	7	4	16	0	1	0	0	47	
<b>Kansas:</b>												
Topeka.....	0		0	89	3	1	0	1	0	0	34	
Wichita.....	1		3	0	10	1	1	0	0	1	62	
<b>Delaware:</b>												
Wilmington.....	1		0	1	2	2	0	1	0	0	31	
<b>Maryland:</b>												
Baltimore.....	3	18	5	3	25	65	0	12	0	3	210	
Cumberland.....	0	1	0	0	0	0	0	0	0	0	7	
Frederick.....	0		0	9	0	0	0	0	0	0	5	
<b>District of Columbia:</b>												
Washington.....	5	1	1	3	18	13	0	13	0	4	140	
<b>Virginia:</b>												
Lynchburg.....	3		0	0	1	3	0	1	0	2	11	
Norfolk.....	0		0	1	3	2	0	2	0	7	36	
Richmond.....	1		0	0	4	5	0	0	0	6	51	
Roanoke.....	0		0	213	1	6	0	0	0	0	14	
<b>West Virginia:</b>												
Charleston.....	0	1	1	0	0	1	0	0	1	6	22	
Wheeling.....	0		0	26	2	3	0	0	0	10	21	
<b>North Carolina:</b>												
Raleigh.....	0		0	1	0	1	0	1	0	0	10	
Wilmington.....	0		0	110	1	0	0	0	0	1	11	
Winston-Salem.....	2	4	0	0	1	2	0	0	0	0	13	
<b>South Carolina:</b>												
Charleston.....	0	37	2	1	2	0	0	4	0	0	23	
Columbia.....	0		0	0	0	0	0	0	0	0		
Greenville.....	0		0	38	0	0	0	0	0	0		
<b>Georgia:</b>												
Atlanta.....	9	20	1	1	11	3	0	1	2	22	75	
Brunswick.....	0		0	1	1	0	0	0	0	0	5	
Savannah.....	0	237	1	0	3	0	0	2	0	0	27	
<b>Florida:</b>												
Miami.....	1	8	0	1	1	0	0	3	0	1	21	
Tampa.....	2	2	2	0	2	1	0	0	0	2	19	

## City reports for week ended March 4, 1933—Continued

State and city	Diph- theria cases	Influenza		Meas- les cases	Pneu- monia deaths	Scar- let fever cases	Small- pox cases	Tuber- culosis deaths	Ty- phoid fever cases	Whoop- ing cough cases	Deaths, all causes
		Cases	Deaths								
<b>Kentucky:</b>											
Ashland.....	1	1	0	5	0	1	0	0	1	0	.....
Lexington.....	0	3	0	2	2	0	0	1	0	0	16
Louisville.....	0	4	0	0	9	11	0	4	0	2	72
<b>Tennessee:</b>											
Memphis.....	0	.....	4	3	11	6	0	4	0	0	92
Nashville.....	0	.....	4	2	6	1	0	4	0	0	50
<b>Alabama:</b>											
Birmingham.....	3	8	2	0	5	2	0	4	0	6	57
Mobile.....	3	.....	2	0	1	0	0	0	0	0	17
Montgomery.....	1	1	.....	1	.....	0	0	.....	0	1	.....
<b>Arkansas:</b>											
Fort Smith.....	0	.....	.....	0	.....	0	0	.....	0	0	.....
Little Rock.....	0	.....	0	1	3	0	0	3	0	0	6
<b>Louisiana:</b>											
New Orleans.....	5	3	4	1	9	10	0	4	2	3	136
Shreveport.....	0	.....	0	0	5	0	0	1	0	0	23
<b>Oklahoma:</b>											
Tulsa.....	1	.....	.....	1	.....	2	1	.....	.....	3	.....
<b>Texas:</b>											
Dallas.....	7	5	5	92	13	6	0	1	0	3	62
Fort Worth.....	1	.....	0	285	3	3	0	2	1	0	29
Galveston.....	0	.....	0	0	2	0	0	0	0	0	9
Houston.....	4	.....	1	49	3	0	1	2	2	0	56
San Antonio.....	4	.....	4	19	3	1	1	10	0	0	53
<b>Montana:</b>											
Billings.....	0	.....	0	0	0	0	0	0	0	0	7
Great Falls.....	0	.....	0	4	0	2	0	0	0	2	8
Helena.....	0	.....	0	0	0	0	0	0	0	0	5
Missoula.....	0	.....	0	3	0	3	0	0	0	0	1
<b>Idaho:</b>											
Boise.....	0	.....	0	24	0	0	2	1	0	0	3
<b>Colorado:</b>											
Denver.....	1	58	1	2	14	22	0	1	0	0	66
Pueblo.....	0	.....	0	0	1	2	0	0	0	2	10
<b>New Mexico:</b>											
Albuquerque.....	2	.....	1	0	0	1	0	3	0	2	11
<b>Arizona:</b>											
Phoenix.....	0	.....	0	11	4	7	0	7	0	0	.....
<b>Utah:</b>											
Salt Lake City.....	0	.....	0	1	3	7	0	0	1	8	27
<b>Nevada:</b>											
Reno.....	0	.....	0	0	3	0	0	0	0	0	8
<b>Washington:</b>											
Seattle.....	0	.....	.....	1	.....	11	0	.....	0	1	.....
Spokane.....	0	.....	.....	1	.....	0	0	.....	0	0	.....
Tacoma.....	0	.....	0	0	3	2	3	0	0	0	28
<b>Oregon:</b>											
Portland.....	1	1	1	4	3	6	3	2	0	1	72
Salem.....	0	.....	0	38	0	0	0	0	0	1	.....
<b>California:</b>											
Los Angeles.....	0	.....	1	0	5	0	0	1	1	1	27
Sacramento.....	0	3	.....	.....	.....	.....	.....	.....	.....	.....	.....
San Francisco.....	2	26	1	4	19	3	0	7	0	55	166

City reports for week ended March 4, 1933—Continued

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
<b>Massachusetts:</b>				<b>Iowa:</b>			
Boston.....	1	1	0	Sioux City.....	2	0	0
<b>Connecticut:</b>				<b>Missouri:</b>			
Bridgeport.....	1	0	0	Kansas City.....	3	3	0
<b>New Jersey:</b>				St. Joseph.....	2	0	0
Trenton.....	1	0	0	St. Louis.....	1	1	0
<b>Pennsylvania:</b>				<b>North Carolina:</b>			
Philadelphia.....	4	2	0	Winston-Salem.....	1	0	0
Pittsburgh.....	2	1	0	<b>Georgia:</b>			
<b>Indiana:</b>				Atlanta.....	3	1	0
Indianapolis.....	3	1	1	<b>Tennessee:</b>			
<b>Illinois:</b>				Memphis.....	2	1	1
Chicago.....	19	13	0	<b>Louisiana:</b>			
<b>Michigan:</b>				New Orleans.....	1	0	0
Detroit.....	1	0	0	<b>Texas:</b>			
Flint.....	0	1	0	Fort Worth.....	1	0	0
Grand Rapids.....	1	1	0	<b>California:</b>			
<b>Minnesota:</b>				San Francisco.....	1	0	0
Duluth.....	1	0	0				
St. Paul.....	1	0	0				

*Lethargic encephalitis.*—Cases: Atlanta, 1.

*Pellagra.*—Cases: Winston-Salem, 2; Charleston, S. C., 2; Miami, 1; Memphis, 1; Birmingham, 1; New Orleans, 2.

*Typhus fever.*—Cases: Savannah, 1.

## FOREIGN AND INSULAR

### INFLUENZA IN EUROPE AND THE BRITISH ISLES

*England and Wales.*—For the week ended February 25, 1933, 344 deaths from influenza were registered in the great towns of England and Wales, as compared with 630 deaths for the preceding week. The general death rate in these towns for the week ended February 25 was 14.2 per 1,000 population. For the preceding week the general death rate was 15.9 per 1,000.

*Northern Ireland.*—Reports for the week ended February 25, 1933, indicated continued decrease in the incidence of influenza in Northern Ireland.

*Europe.*—Reports of the prevalence of influenza in a number of European countries indicated generally a decrease in the incidence of influenza during the latter part of February.

### CANADA

*Provinces—Communicable diseases—Two weeks ended February 25, 1933.*—The Department of Pensions and National Health of Canada reports cases of certain communicable diseases for the two weeks ended February 25, 1933, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis		1	1							2
Chicken pox		10	1	354	745	118	36	4	110	1,378
Diphtheria	1	1	3	39	19	9	18	4		94
Dysentery									1	1
Erysipelas				11	1	8		1	3	24
Influenza		75		6	73	3			60	217
Measles		35	17	311	526	3	2	19	23	937
Mumps		2			558	68	4		12	644
Paratyphoid fever					6					6
Pneumonia		4			10				4	18
Poliomyelitis				5					1	6
Scarlet fever		10	10	191	148	43	29	7	17	455
Smallpox							9			9
Trachoma					1				41	42
Tuberculosis			5	159	78	26	35	9	51	373
Typhoid fever		2	3	20	13	11	1	3	1	54
Undulant fever					3					3
Whooping cough		2		294	211	59	46	8	35	655

DENMARK

*Communicable diseases—October–December, 1932.*—During the months of October, November, and December, 1932, cases of certain communicable diseases were reported in Denmark as follows:

Disease	Cases			Disease	Cases		
	Oct.	Nov.	Dec.		Oct.	Nov.	Dec.
Cerebrospinal meningitis.....	11	7	6	Poliomyelitis.....	7	9	1
Chicken pox.....	1	43	42	Puerperal fever.....	7	18	16
Diphtheria and croup.....	354	395	370	Scabies.....	858	1,127	820
Erysipelas.....	307	342	245	Scarlet fever.....	252	339	210
German measles.....	.....	2	3	Syphilis.....	67	78	59
Gonorrhoea.....	930	888	685	Tetanus.....	6	7	8
Influenza.....	4,968	4,759	4,231	Typhoid fever.....	5	3	5
Lethargic encephalitis.....	10	3	1	Undulant fever (Bac. abort. Bang).....	34	40	37
Measles.....	836	1,032	745	Whooping cough.....	1,404	1,550	1,243
Mumps.....	110	200	220				
Paratyphoid fever.....	111	58	8				

MEXICO

*Tampico—Communicable diseases—February, 1933.*—During the month of February, 1933, certain communicable diseases were reported in Tampico, Mexico, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria.....	2	.....	Scarlet fever.....	1	.....
Enteritis (various).....	24	26	Smallpox.....	1	.....
Influenza.....	28	2	Tuberculosis.....	.....	25
Leprosy.....	2	.....	Typhoid fever.....	2	.....
Malaria.....	116	7	Whooping cough.....	1	.....

**CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER**

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for February 24, 1933, pp. 200-210. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued March 31, 1933, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

**Cholera**

*Philippine Islands.*—For the week ended March 11, 1933, 2 cases of cholera with 2 deaths were reported in the Province of Cebu, Philippine Islands, and 23 cases with 21 deaths in the Province of Leyte.

**Plague**

*Argentina.*—Plague has been reported in Argentina as follows: January 10–25, 1933, 10 cases and 7 deaths in Tumbaya, Jujuy Province; January 25, 1933, 1 case and 1 death at Laguna Larga, Cordoba Province.